

Conceptualising Duolingo and its Affordances and Constraints as a Learning Tool in ESL Reading Classrooms: A Concept Paper

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Abstract

Duolingo is one of the few technologically advanced tools being explored for its potential to enhance English teaching and learning. Its purpose is considered to be the next frontier, making it a digital platform equipped with learning concepts while playing. It is also accessible not only on the Internet, but also by using Android, iOS, and Windows Phone versions where students can study at their own speed. They may customise their learning style accordingly, which thus will then encourage effective learning with greater results in the teaching and learning of English as a second language. Nevertheless, it is not a simple undertaking. This concept paper investigated the potential and challenges of using a Duolingo app as a tool for teaching English. This paper provides a conceptual framework that can be useful for measuring the current level of reading comprehension mastery among Year Six pupils in Selangor. In addition, it examines students' perceptions of using Duolingo in improving their reading comprehension skills. The proposed research suggests using a mixed-method design which involves a pre- and post-test procedure with a test sheet as the research instrument and questionnaires to collect data. The proposed sampling will consider the sample selected to accurately represent the population and represent all relevant variables to avoid bias. The collected data is then expected to be analysed using inferential statistics. This research is anticipated to act as a catalyst in inspiring ESL teachers about the effectiveness of Duolingo as an additional material in maximising the benefits of language acquisition.

Keywords: Duolingo, ESL Classroom, ESL Learners, Motivation, Vocabulary.

Introduction

Since the introduction of the New Education Policy in 1970, English as a global language has served as a second language and become a compulsory subject in Malaysian schools. Yunus et al (2020) also concurred that the new generation must be proficient in the English language given the current state of globalisation. Nevertheless, learning the language is both demanding and challenging, either as a second language (L2) or as a foreign language

(Jaikrishnan & Ismail, 2021). This is because most students lack linguistic proficiency since birth while needing to acquire a variety of skills in order to advance their knowledge for the future (Sani & Ismail, 2021). One particular language skill needed is reading comprehension, which is the most important skill in the academic environment (Indriyana & Kuswandono, 2019). Krashen (2014) defines reading as an ability to comprehend book content, including understanding terminology, the author's range, writing style, spelling, and syntax that requires a reader to decode and comprehend it. Reading complex texts is a problem for ESL students, as demonstrated by Mohaideen et al (2020), who also revealed that primary school learners have trouble reading English literature. Therefore, Al Raqqad et al (2019) suggest that effective techniques are crucial, especially when reading difficult texts.

English teachers in primary schools across Malaysia grapple with a multitude of challenges when it comes to teaching reading comprehension effectively. One major issue is the language proficiency levels of students. Aziz and Kashinathan (2021) assert that this is because they are from a community where English is not the primary language. While English is introduced as a subject early in the Malaysian education system, many students still struggle with basic language skills, hindering their ability to comprehend texts in English.

Yet, integrating Information Communication Technology (ICT) into ESL classrooms increases student engagement and enthusiasm for learning, if not fosters a positive learning environment (Azmi, 2017). In fact, studies have also shown that using ICT in ESL classrooms offers materials availability, improves students' attitudes and autonomy, besides creating authenticity, enhancing student-centeredness, and allowing self-assessment (Hashim et al., 2018; Lim & Yunus, 2021). By incorporating technology into the teaching of English literature at school, added Salleh and Ismail (2022), it is likely to increase students' enthusiasm for learning. This then has encouraging results that will increase student achievement (Alobaid, 2020). In fact, Fansury et al (2020) argued that using digital content in language teaching can increase student motivation and interest in learning. Sun and Gao (2020) argued that motivated students have a tendency to practise their language skills more frequently and productively.

Duolingo, an application that integrates ICT technology for the purpose of language learning enhances the efficacy of learning a second language (Loewen et al., 2019), which is proven to be an effective medium in effective teaching and learning vocabulary (Ajisoko, 2020). Additionally, Li and Bonk (2023) asserted Duolingo as encouraging self-directed learning where students keep track of their own learning progress while it is also proved to increase students' metacognitive awareness and allow them to be actively engaged in learning activities (Kessler, 2021). Despite the debate around these programmes' efficacy, technology like Duolingo nevertheless has an influence on its users outside of the classroom. The remainder of the section will go through the specifics of Duolingo's characteristics, numerous studies that have been done on it, its potential for usage by ESL students and teachers, and its drawbacks. As a result, this paper posed the following two research questions:

- a) What reading comprehension abilities do pupils in Year Six possess?
- b) How well does Duolingo help pupils with reading comprehension?

Literature Review

Reading

As one of the primary language skills in English, reading is a difficult cognitive activity that involves decoding symbols in order to create or extract meaning (reading comprehension) (Brown, 2004). It is a tool for learning languages, communicating, and exchanging knowledge and concepts. In fact, reading is an interactive process that involves both the reader and the

text and leads to automatic or fluent reading (Alyousef, 2006). It involves the reader's thinking to understand in depth what the writer is conveying (Noordan et al., 2022). According to Samat et al (2019), understanding depends on the reader's capacity to employ schema knowledge through top-down and bottom-up prediction and inference. This information comprises contextual knowledge, cross-cultural understanding, and knowledge of reading structure, which is just as crucial as language proficiency.

The development of proficient reading skills is a fundamental aspect of language learning, not only in the English classroom but also outside of the classroom. This claim emphasises how crucially important proficient reading skills are in the larger context of language learning. For instance, reading helps pupils' cognitive skills grow in a variety of everyday reading activities (Rohaizat & Aziz, 2021). Effective readers are also found to have more opportunities to broaden their mental horizons (Rajasagaran & Ismail, 2022), especially to achieve more in the twenty-first century, where people are expected to have a reading literacy level sufficient to keep up with the rapid development of the modern world. Reading forms the foundation for understanding written communication, acquiring new vocabulary, and comprehending complex texts. It is no exaggeration to say that reading is the most crucial talent for assuring academic achievement (Nufus & Ifadloh, 2021; Al Raqqad et al., 2019). Regarding the significance of reading skills, Yunus et al (2020) emphasised the value of reading abilities, in which students must comprehend the material they read in order to produce effective language. Good reading abilities require long-term growth, and children will ultimately learn well because they can read a variety of texts with interest and pleasure as well as for diverse reasons when there is understanding (Snow, 2002). Reading literacy is crucial for self-improvement, personal branding, professional growth, education, and societal development (Rintaningrum, 2019). One of the most important resources for the growth of a nation is a society with a strong reading culture.

In English classrooms, the importance of reading skills is magnified due to the language's widespread global usage and its role as a lingua franca (Abdullah et al. 2019). English serves as a bridge that connects individuals from diverse linguistic backgrounds (Joo et al. 2020; Li et al. 2020), making reading comprehension a central facet of communication and cultural exchange. Students who develop strong reading skills in English classrooms gain the ability to access a wealth of information, ranging from literature and academic texts to online resources and multimedia content. This empowers them to become informed and critical thinkers, capable of analysing, interpreting, and evaluating information from various sources (Mahanal et al., 2019). In a study conducted by Yunus et al (2020), along with aiding in better comprehension and continued language usage after class, pleasure reading also affects other language abilities like writing and speaking. Zakaria et al (2022) believed reading is one of the most effective strategies that language learners may use to develop their productive abilities, such as writing and speaking. Reading comprehension plays a crucial role in establishing comprehensive language competence, as evidenced by the reciprocal link between reading and other language abilities. Hence, a fundamental pillar of language acquisition, particularly in the setting of English schools, is the development of proficient reading abilities. Learning to read well opens opportunities to knowledge, empathy, and successful communication for pupils.

Learning tools in reading classrooms

Traditional learning tools have long been the foundation of reading instruction in classrooms across the world. These tools encompass a range of materials, including printed books, flashcards, graphic organisers, and physical manipulatives. Research consistently highlights

the enduring relevance and effectiveness of these traditional resources in fostering essential reading skills. For instance, printed books have been shown to provide tactile engagement (Evans, 2017; Loh et al., 2019), allowing young readers to explore text (Singer & Alexander, 2017) and illustrations, which can enhance comprehension and vocabulary acquisition. For instance, Haro (2019) found that using graphic organisers helped students better organise information from texts, engage readers' existing knowledge, and encourage encoding techniques that would eventually lead to higher retention. It is supported by Mangen et al (2019) who found that better performance is achieved when using physical books compared to digital reading devices. Moreover, graphic organisers and reading response journals promote critical thinking and textual analysis skills. Studies conducted by Hedgcock et al. (2018) underscore the continued value of traditional learning tools in reading classrooms, emphasising their role in building strong foundational skills. Lumapenet (2022) found out reading problems through the use of multimedia resources like powerpoint, films, charts, and flashcards. In fact, it may also considerably improve student learning as well as be useful in enhancing reading abilities.

According to Haleem et al (2022), traditional classroom instruction fails to provide an immediate learning environment, faster assessment, and more engagement. The integration of learning tools in reading classrooms has garnered significant attention in recent years as educators seek innovative ways to enhance reading instruction. Research in this domain has highlighted the positive impact of technology-based tools on students' reading skills. For instance, according to Kao et al (2019), readers are engaged in the reading process when using electronic books, which is consistent with Kaynar et al (2020), who found that using gamified learning increased reader engagement. Students in the study read additional texts without fully comprehending the context to win more rewards. In contrast to students who used standard printed texts, those who utilised interactive e-books showed higher levels of interest and understanding, according to (Zhao et al., 2021). Technology in reading classrooms offers the ability to decrease reading proficiency gaps, improving accessibility and enjoyment of learning for a varied range of student demographics.

Language Learning Applications

The development of technology has had a tremendous impact on many aspects of life, including education. Technology is widely used today and is a fundamental aspect of daily life (Avelino & Ismail, 2021). A software programme or mobile application created to support the acquisition, development, and improvement of language abilities is defined as a language learning application (LLA). They are typically downloaded from app stores like Apple App Store or Google Play Store. It differs from language learning websites in that it can only be accessible through web browsers and is therefore dependent on an internet connection. To improve learning results, LLAs were initially launched (Kacetl & Klímová, 2019). Anak Yunus and Hua (2021) believed these applications leverage technology to provide users with interactive and engaging tools for learning and practising languages besides increasing participation and offering a satisfying educational experience in a relaxed environment. Numerous linguistic topics, such as vocabulary, grammar, pronunciation, listening comprehension, reading, writing, and speaking, can be covered by LLAs. These applications, which can be downloaded for language learning, include abilities including speaking, listening, reading, and writing as well as spelling, grammar, and vocabulary. They also offer a range of levels of proficiency and objectives (Al-Jarf, 2022). The advantages of using applications for learning English generally and covering different abilities have been looked into in a number of literature research. For instance, Kacetl and Klímová (2019) looked into how well mobile apps work for learning a

second language like English. Researchers discovered that it supports the development of personalised learning and aids low-performing pupils in accomplishing their academic objectives. In addition, Kohnke (2020) looked into how Hong Kong university students felt about a vocabulary-learning programme she had created as a tool to aid students in developing their L2 receptive vocabulary. Undergraduate students are highly motivated to utilise the Application to acquire L2 vocabulary, the researcher discovered. Additionally, Famularsih has demonstrated the effectiveness and efficiency of using English learning tools in 2020, particularly during the Covid-19 pandemic. Another research by Mandasari and Aminatun (2020), including 40 college students, discovered that utilising the learning application Vlog significantly improved students' speaking abilities.

Since its launch in 2011, Duolingo as one of the most widely used language-learning applications is available for download from its website (<http://www.duolingo.com>) and can be used as a digital platform for language learning. Besides Spanish, French, and German, there are other applications which also provide English and other languages (such as Welsh, Irish, and Swahili). Students and teachers may use this application to share ideas and learn from others' experiences, while allowing them to track progress in the learning materials (Tiara et al., 2021). Since its introduction, numerous studies have been done on the effectiveness of using this application at acquiring different languages. For instance, Jiang et al (2021) showed via their research how beneficial Duolingo is for learning French and Spanish. Huy (2023) concurred as well after discovering in his research that Duolingo can facilitate the acquisition of Japanese.

Duolingo incorporates a variety of strategies to improve student learning where there are a variety of worksheets to address different learning needs (Liang, 2018). These worksheets are observed to be multimodal in nature where there are matching activities which require learners to match words with images, thus would appeal to learners with visual inclination. There are also exercises that allow students to translate words or phrases from their native tongue into another language. At the same time, there are available listening activities that ask pupils to listen to English words, sentences, or phrases and type the answers accurately. This would appeal to those that are auditory in nature. The application also offers speaking tasks that require students to listen to certain English words, sentences, or phrases and correctly pronounce them. In fact, this variance in activities may boost students' enthusiasm when learning difficult English (Hidayati & Diana, 2019). Yana (2021) concurred, stating that they prefer using the Duolingo application as a tool to aid English language learning at secondary schools since it is engaging, inspiring, practical, and boosts students' self-confidence. Munday (2016) stated that Duolingo is versatile since it may be used both in-person and online as supplemental material to official school or university study. According to him, it turns out that the desktop version of the app offers more regions, despite being accessible via desktop and mobile devices.

Duolingo and its impact, affordance, and constraints

Unquestionably, several studies have demonstrated the usefulness of Duolingo in a variety of areas and skills. One of them is Duolingo, which constantly motivates English language learners to study independently, with students dedicating 11 to 57 minutes daily, well beyond the recommended 5 minutes (Hidayati & Diana, 2019; Habibie, 2020). Motivation is pivotal in energising and promoting self-regulated learning (Sun & Gao, 2020). Duolingo's versatility, spanning pronunciation, translation, spaced repetition, and various tasks, fosters language mastery (Munday, 2016). It enhances vocabulary and grammar, bolstering daily language use (Vasileiou & Pili-Moss; Tiara et al., 2021). Duolingo facilitates autonomous learning,

encouraging students to take control of their education (Cakici, 2015). It elevates student autonomy, English reading skills, and willingness to learn (Hakimantieq et al., 2022). Duolingo also aids reading comprehension (Ajisoko, 2022) and vocabulary growth (Nasichah et al., 2022; Ajisoko, 2020).

From a different angle, Duolingo is a highly beneficial programme for translation needs as well. As a translation tool, Duolingo excels (Garcia, 2013; Milyarni et al., 2021) by enhancing translation skills, aiding learning, and facilitating self-correction (Bahjet, 2016). Duolingo in fact effectively bolsters listening and speaking skills (Putri & Islamiati, 2018), supported by mobile accessibility (Ahmed et al., 2022). The app enhances writing abilities and lowers grammar errors (De Sousa et al., 2018; Syahputra, 2019). Grammar and writing go hand in hand, and Duolingo fosters grammar knowledge (Fatmawati et al., 2023). Another advantage is, Duolingo's gamified features enhance the language learning experience by making it engage and fun, motivating users to practise regularly and progress faster in their language studies. Duolingo's gamified approach engages learners (Redjeki & Muhajir, 2021) and offers practicality and affordability, accessible on various platforms (Burstein et al., 2021; Loewen et al., 2019). It aligns with mobile learning, promoting self-paced, self-directed learning (Chen et al., 2020). Duolingo encourages lifelong learning and is instrumental in developing self-regulated learners (Haidari et al., 2019). Gamification elements like points and rewards enhance motivation (Huynh et al., 2018; Tiara & Rahman, 2021). Duolingo's interactive features, such as games and quizzes, make learning enjoyable and foster motivation (Saraswati & Purwati, 2021). The app promotes self-monitoring through progress tracking, XP systems, and skill strength bars (Kessler, 2021; Pazilah et al., 2019). Self-monitoring is crucial for language acquisition (Cola, 2021). In summary, Duolingo emerges as a valuable tool that motivates learners, enhances language skills, promotes self-regulated learning, and supports lifelong language acquisition, all while providing accessible and interactive language learning experiences.

Despite all the benefits Duolingo provides, its usage by instructors and students for ESL learning is restricted due to several factors. Duolingo is suitable only for beginner and intermediate levels when it comes to teaching content aspects, where it concentrates on teaching the fundamentals of the language and may not include more advanced or nuanced aspects because, as found in Jung's study (2019), the provided exercises are repetitive and will be less enjoyable for advanced students. If a learner cannot achieve an advanced level in the language they are studying, they may find it challenging to communicate successfully in that language (Aziz & Kashinathan, 2021). As a result, they are unable to fully participate in situations where language abilities are necessary, such as in the workplace or in social settings (Bukhori et al., 2022; Afzal, 2019). Another drawback of Duolingo is it does not offer live feedback from actual educators, only automatic feedback on the activities that are currently accessible. Therefore, the mistakes found do not provide in depth justifications or context-specific advice (Shortt et al., 2021). In addition, Duolingo employs live translation, which might occasionally be different from what pupils learn in a classroom with an actual teacher (Pratasik, 2022). Despite the complexity of technology, human teachers have distinctive qualities that can improve the effectiveness of teaching and learning. The innate abilities of a teacher, such as emotional intelligence, creativity, and communication, are crucial and will continue to be needed in the future, claim (Edwards and Cheok, 2018). They contend that many common educational tasks, such as lesson planning and scheduling, need for human interaction as opposed to machine assistance. In 2016, Blututors confirmed this claim, arguing that robots cannot motivate humans or develop emotional intelligence and social skills in the same way that people do. Robot teachers cannot comprehend the sentiments, imagination,

and attitudes of pupils since robots are emotionless, according to research by Mahdi et al (2021) testing the application of robot technology in education and business. Additionally, context-specific justifications and recommendations are crucial for student growth since they boost comprehension while also inspiring and empowering students' mastery of the learning. Duolingo was also determined to have shortcomings in terms of enhancing speaking abilities. This skill is constrained in Duolingo due to its emphasis on reading, writing and listening skills. Although it provides speaking practice, it is not so much practice for other skills, so it is only suitable for beginner level students (Jiang et al., 2021). Since speaking ability is important for future job opportunities, it is highly emphasised among ESL students (Rajendran & Yunus, 2021). Students will participate in class activities if they have good speaking skills, which increases their confidence. The largest obstacle to teaching speaking to ESL students, according to Nasir and Aziz (2020), is their lack of confidence. Therefore, according to Aziz and Kasinathan (2021), it is important to use effective strategies to increase their confidence. Their language development is aided by this confidence, which also helps children overcome their anxiety of making mistakes (Toro et al., 2019).

Although in the ESL classroom, vocabulary is crucial since a large vocabulary is required for clear expression and comprehension in speaking, reading, and listening, Duolingo was found not to be able to improve these skills optimally. According to Habibie (2020), Duolingo has a limited vocabulary since the vocabulary and subjects are set by the designer of the course. This is so because vocabulary serves as its foundation. Ariffin (2021) stated that ESL students require a range of vocabulary to successfully convey their thoughts, ideas, and feelings from a communication perspective. Vocabulary learning is one of the most crucial components of language learning and is seen by Sivagnanam and Yunus (2020) as a crucial instrument for learning a second language. ESL students require a range of vocabulary to successfully communicate their thoughts, ideas, and feelings from a communication standpoint. They can speak clearly and fluidly if they have a strong vocabulary. Vocabulary abilities are crucial for comprehension in reading in addition to speaking. According to Raw and Ismail (2021), in addition to speaking, ESL students' vocabulary competency has a significant impact on their language proficiency as well as other abilities like speaking, reading, and listening.

The final area of Duolingo's problem relates to the application's performance. Duolingo is not available offline if its users do not subscribe to Duolingo Plus where this subscription may not be accessible to those who are not financially able. This was noted by Jaelani and Sutari (2021) in their study, which discovered that its respondents believed that Duolingo's lack of an internet connection was a weakness. This supports the finding of Hashim et al (2019) that a lack of broadband wireless access hinders the use of Mobile Assisted Language Learning (MALL). Technical issues like sluggish Internet connections, server crashes, software flaws, or device malfunctions may make it difficult to employ technology-enhanced learning. According to Jaikrishnan and Ismail (2021), issues with digital learning would annoy and put strain on instructors and pupils. As Rafiq et al (2021) also note, having access to the internet is a barrier to mobile learning. Success in learning will be more stifled.

After considering all the advantages and obstacles brought by Duolingo, it was found that all the benefits offered by this application outweigh the constraints faced when using it. So before implementing Duolingo in the classroom, there are a number of things to consider in terms of English teaching and education (Ritonga et al., 2022). Using Duolingo by itself is not sufficient for advanced language proficiency (Tsai, 2022). Students should take a language class or practise with a native speaker in addition to Duolingo.

Methodology*Suggested Research Design*

Research design provides a structural plan that demonstrates how all the major components of the research attempt to address the research question (Asenhabi, 2019). As such, its choice is essential, since it entails the strategy used to gather data to provide legitimate, dependable, and correct information about the subject under study. Drawing upon a mixed-method study design, the research involves a quantitative analysis of user performance data collected from pre- and post- test procedure and followed by a qualitative analysis for investigating the pupils' perception on using Duolingo to improve their reading comprehension.

The samples for this study will be purposely selected among Year 6 language learners with a range of low and intermediate English language proficiency, based on their performance in the classroom assessment (PBD) for the subject to gauge their degree of competence. 40 pupils will be purposely selected as samples. The researchers utilised responses from pupils at one of the researchers' own schools owing to time and financial restrictions. Additionally, the respondents are homogenous, which is believed to be a sizable population that would raise ethical questions about topics like consent or privacy. Besides quantitative research design, this research takes on qualitatively by collecting data through surveys to assess Year 6 pupils' attitudes toward the Duolingo application.

In order to administer both types of research methods, a questionnaire will be adapted from (Ajisoko, 2022). The questionnaire will serve as a tool to explore samples' perceptions of using Duolingo to improve their reading comprehension skills. The samples will complete the questionnaire using a pen-and-paper concept. It consists of four parts with 13 questions altogether: Part A asks for the pupils' demographics (detailing on gender, students' interest, and possession of ICT equipment) while Part B asks for Duolingo usage (i.e., possession of a Duolingo account, frequency of use, and familiarity of the app). In Part C, there are 10 closed-ended questions, formulated using a 5-point Likert scale with four levels: "Strongly Disagree," "Disagree," "Neutral", "Agree," and "Strongly Agree." To ensure that everyone has a viewpoint on a statement, a 'Not sure' option is not there. According to Jamieson (2004), people can indicate how much they agree or disagree with a statement using a 5-point Likert scale that seeks to gauge their attitude. A 5-point Likert scale is also seen to be less perplexing and to boost response rates (Bouranta et al., 2009), which is believed to be more trustworthy and transparent as a result. Finally, in Part D, there are 3 open-ended questions, which serve as an instrument to collect qualitative data on the samples' views aspects which are: the effectiveness of using the Duolingo application to aid their reading comprehension process, difficulties encountered while using the app, and its effects on their motivation and confidence to read.

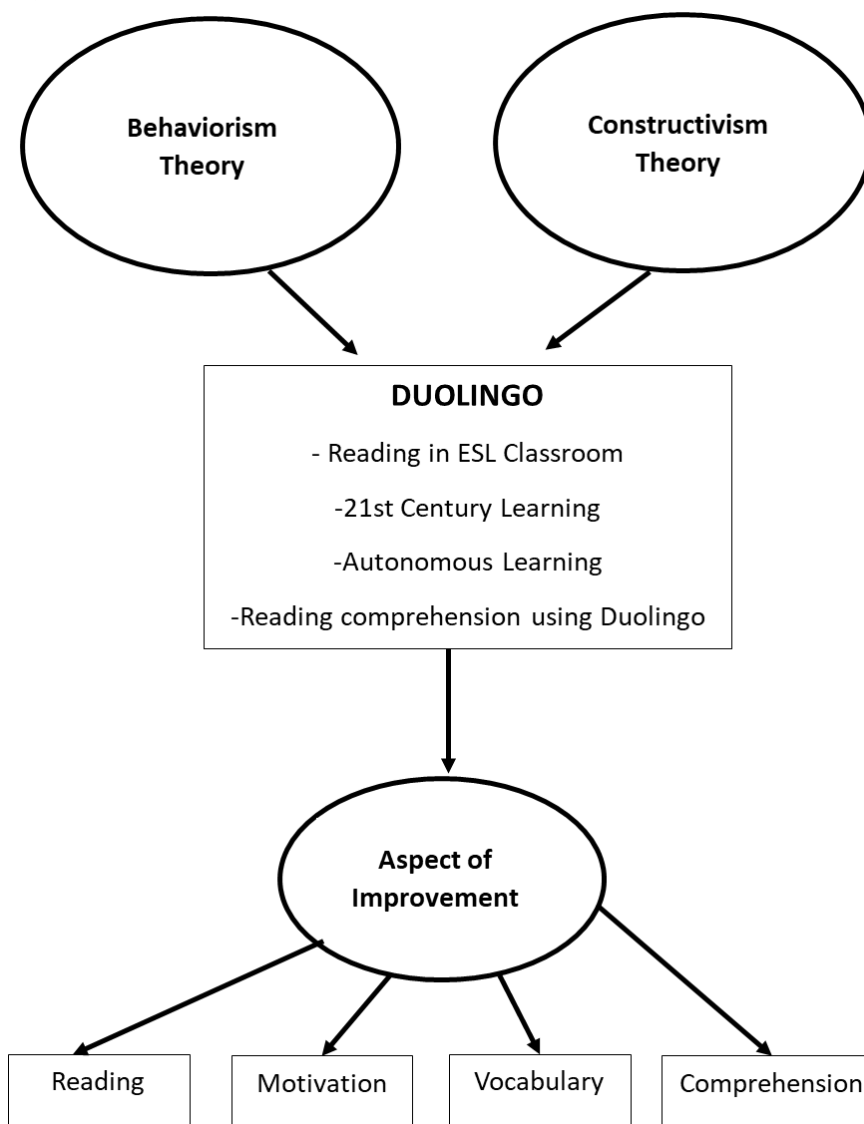


Figure 1- Conceptual Framework

A framework to help the researchers organise and carry out their research investigations efficiently is provided by Creswell's three processes for sampling and data gathering (see figure 2). Finding the people or groups who will participate in the research project is the first stage. In the framework of a school, there are two student populations: elementary schools and secondary schools. In this study, primary and secondary school students make up a larger population, whereas primary school pupils are chosen for a particular group depending on their location and educational level.

The second step is to select the sample. After determining the target demographic, researchers must choose a sample from that group. According to Uttley (2019), the sample size has a significant impact on a study's sensitivity and its capacity to provide accurate information on the population that has been studied. The researchers will take great care to make sure that the sample chosen can accurately reflect the population chosen. Primarily, Malaysian ESL children that take English in primary school will be the demographic researched in this study. Instead, the authors can think about using purposive sampling, which enables researchers to concentrate on particular elements of a study topic or target (Parker et al., 2019). Researchers can successfully collect data that supports their study objectives by choosing participants or instances that are most likely to supply the needed information.

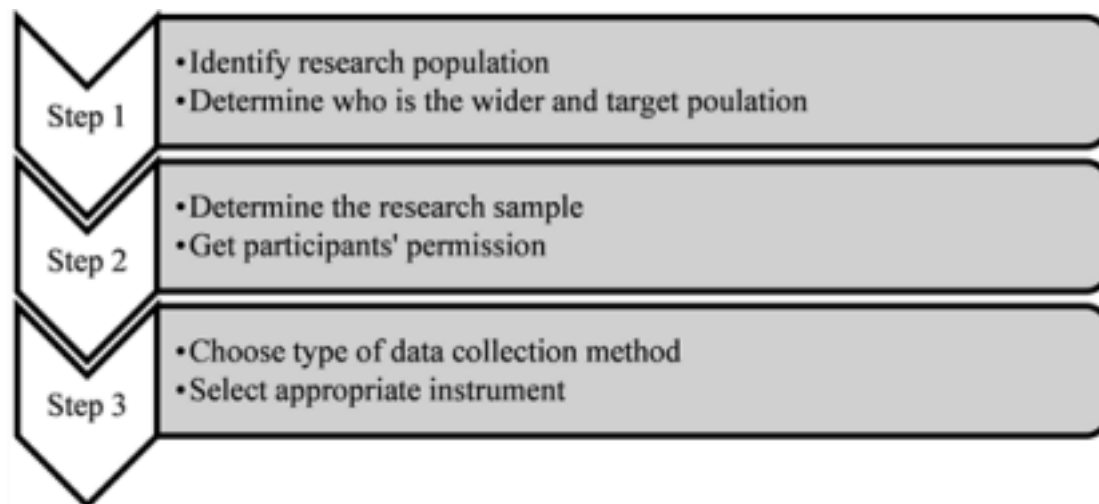


Figure 2-The procedure Creswell (2012) used to gather data.

Choosing the type data to be gathered is the third stage. Here is also where the selection of data collecting, and collection tools is made. Test sheets are one type of instrument that might be used in this study. Test sheets make it possible to replicate and validate results (Desnita et al., 2021). It is easy to compare results and reproduce findings by having numerous researchers or studies use the same test sheet. This improves the research's robustness and generalizability. Additionally, it is frequently simpler to analyse quantitative data obtained from test sheets than qualitative data. It is simpler to draw conclusions and explain results to others when using numerical values and statistical analysis since they give succinct and straightforward explanations.

Suggested Research Analysis

Running inferential statistics, according to Pflieger (2022) allows one to form opinions, make predictions, and carry out research. As a result, the researchers suggested using descriptive analysis, which enables data exploration and summarization. Creating graphs, charts, and other visual representations of data is a common step in descriptive analysis. Analysts can convey their results more effectively and help decision-makers rapidly understand complicated information by using visualisations to make it easier to access and understand. According to Mohajan (2020), numerical data is generated and utilised to generalise the findings from a broader sample group by measuring attitudes, views, behaviour, and other defined characteristics.

Meanwhile, the qualitative data analysis in this study employed a thematic analysis approach to explore and interpret the rich and diverse perceptions of respondents concerning the utilisation of the Duolingo application for enhancing ESL reading comprehension skills. In order to find, examine, and present patterns (themes) in data sets, Virginia Braun and Victoria Clarke established this methodology in 2006. Data familiarisation is the first action that will be taken, during which the researchers will examine and delve further into the 13 sets of questions that the respondents have completed. They will next start the basic coding process by creating a code (label) to reflect the content's meaning. Then, a theme will be created by grouping together relevant code to create the basic theme. The students' opinions on the three open topics will be divided into recently emerging domain themes and analysed as such. Then, the researchers will examine and review the themes produced. If there is data that can be combined or separated, it will be refined. They will then name the theme to accurately

reflect its content and meaning. An accurate and descriptive name will be chosen. After getting the theme clearly, the relevant text or data section will be assigned to each theme. After that, a chart or map is constructed to illustrate the relationship between themes in order to identify patterns. Next, a coherent narrative that forms the basis of research findings will be constructed. The researchers will ensure that it can explain the theme and its importance in relation to the research question or objective. To obtain quality assurance, transparency, and credibility the thematic analysis will be implemented. Finally, the results of the thematic analysis will be included in the research report.

Conclusion

Duolingo is a popular and gamified language learning tool that offers advantages for both beginners and advanced learners. It is recommended to use Duolingo in conjunction with other resources like conversation drills, immersion activities, and authentic content to achieve the best learning outcomes. To promote Duolingo's use, administration and educational personnel must provide technical assistance and instructions. ESL students should be encouraged to use Duolingo by their superiors and implementation team, and they should be given confidence in its efficiency. Educators must investigate Duolingo's purpose and usage, provide technical assistance, and introduce the app to teachers to inspire their use in the classroom. Teachers should regularly assess students' development and seek feedback to improve their educational experience. Teachers should also receive suggestions on integrating Duolingo into the classroom. In conclusion, Duolingo can be used as a complement to traditional English language instruction, allowing students to practise speaking, listening, and writing skills. However, using Duolingo as a supplemental material for learning English as a second language requires careful planning and cooperation from all stakeholders. Duolingo's success depends on the collective responsibility of recognizing its contribution to meet the demands of the current generation, who demand gamified, entertaining education.

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